Regional climate studies and application with variable-resolution GCMs (Canadian component)

Jean Côté (Co-PI)[1], Bertrand Denis[1], Bernard Dugas[1],
Sandrine Edouard[1], Abdessamad Qaddouri[1],
René Laprise[2], Daniel Caya[2]

1. Meteorological Service of Canada 2. University of Quebec at Montreal

The proposed research is the continuation of the joint U.S.-Canadian study started three years ago under the previous CCPP proposal during which the Canadian stretched-grid Global Environmental Multiscale (GEM) model was developed and adapted for climate simulation purposes. The new study will be devoted to:

1. Research in parallel computing and numerical methods (iterative solvers, conserving and shape-preserving advection schemes, general domain decomposition on the sphere)
2. Atmospheric chemistry related to climate issues (the GEM model with passive tracers, tropospheric and stratospheric chemistry modules)
3. Validation of regional climate modeling strategies for nested- and stretched-grid models; decadal time-scale investigation with the GEM model including the 17-year (1979-1996) AMIP2 runs with both uniform- and variable-resolution grids, with 0.5 degree global and regional resolution, respectively. (Note that this planned unprecedented high-resolution, 0.5 degree uniform grid, 17-years long GEM model simulation will serve as reference for a number of investigations to compare the variable-resolution and limited-area nested approaches in climate mode.)
4. Participation in intercomparison projects (SG-MIPS and PIRCS).